

Notes - Solutions by Factoring + the Zero Product Property

■ In the space to the right, state what happens in each step why.

Ex 1: $x^2 + 5x + 6 = 0$

$$(x+2)(x+3) = 0$$

So, either $(x+2) = 0$

or $(x+3) = 0$

$$\begin{array}{r} x+2=0 \\ -2 \quad -2 \\ \hline \end{array}$$

$$x = -2$$

$$\begin{array}{r} x+3=0 \\ -3 \quad -3 \\ \hline \end{array}$$

$$x = -3$$

$$x = -2 \text{ and } -3$$

_____ (what?)

_____ (what?)

_____ (why?)

_____ (what?)

Ex 2: Find the solutions of $4x^2 + 16x = 0$

$$4x(x+4) = 0$$

So $\begin{array}{r} 4x=0 \\ 4 \quad 4 \end{array}$ or $\begin{array}{r} x+4=0 \\ -4 \quad -4 \end{array}$

$$x = 0 \text{ and } x = -4$$

_____ (what?)

_____ (what?)

_____ (what?)

Ex 3: Find the solutions of $x^2 - 4x = 12$

$$x^2 - 4x - 12 = 0$$

$$(x-6)(x+2) = 0$$

so $x-6=0$ or $x+2=0$

$$x = 6 \text{ and } x = -2$$

_____ (what?)

_____ (why?)

_____ (what?)

_____ (what?)

_____ (what?)

Based on the three examples, find some patterns.

- Before you can factor, what do you need to make sure the equation is equal to? why?
- What do you do right after you factor? Why do you think this is called using the "zero product property"?
- What is the last step in this method of solving by factoring?

Now You Do!

1) $x^2 + 7x + 10 = 0$

2) $3x^2 = 10x$